What is claimed is:

1. A method for measuring the presence or absence of phosphate groups attached to biological molecules in a sample, whereby these molecules are tagged with fluorescent markers and these fluorescent markers are activated by means of irradiating the sample with light, **wherein** the method encompasses the following steps:
   a) Use of a fluorescent marker, the fluorescence lifetime of which assumes a different value depending upon the presence or absence of phosphate groups attached to the biomolecule;
   b) Measurement of the fluorescence lifetime of the fluorescent marker attached to a biomolecule and selected in accordance with Step a);
   c) Classification of the biomolecules in accordance with the presence or absence of phosphate groups attached to these, based on the different lifetime of each.

2. The method of Claim 1, **wherein** the biological molecules are selected from a group which comprises an amino acid sequence, such as proteins, peptides, glycoproteins and lipoproteins.

3. The method of Claim 1, **wherein** the fluorescent marker is selected from the group which comprises fluorescein and fluorescein derivatives.

4. The method of Claim 1, **wherein** the biological molecules of a sample are incubated with a phosphatase or with a phosphokinase prior to the measurement of the state of phosphorylation.

5. The method of Claim 1, **wherein** one or more steps selected form the group of marking of biological molecules, activation of the assay, and measurement of the fluorescence lifetime is conducted in a multiwell plate, such as a microplate with 96, 384 or 1536 wells and with a computer for automatically classifying the biomolecules or the samples respectively.

6. The method of Claim 1, **wherein** the measurement of the fluorescence life-time is undertaken by means of time correlated single photon counting (TCSPC) or by means of the phase modulation technique.

7. The method of Claim 1, **wherein** the proportion of the two species of bio-molecules in the assay is quantified by means of calibration.

8. Use of the method in accordance with one or several of the Claims 1 to 7 for drug discovery screening of chemical agents for pharmacologically effective substances

9. Use of the method in accordance with one or several of the Claims 1 to 7 for drug discovery screening of chemical agents for manufacturing pharmacol-ogical preparations.

10. Use of the method in accordance with one or several of the Claims 1 to 7 for detecting defects in human or animal enzymes.

11. Use of the method in accordance with one or several of the Claims 1 to 7 for detecting a reaction involving enzymes from one of the Classes I-VI.

12. Use of the method in accordance with one or several of the Claims 1 to 7 for quantifying a reaction involving enzymes from one of the Classes I-VI.